What is claimed is:

1. An X-ray fluorescence film thickness measuring device comprising:

a high-voltage supply for exciting fluorescent X-rays;

an X-ray generating system constituted by an X-ray tube;

means for focusing primary X-rays emitted from the X-ray generating system onto a microscopic part using a slit, collimator, or capillary utilizing the total reflection phenomenon;

a sample observation optical system for deciding a position of a measuring position of a measuring region on the microscopic part; and

a system having a pin diode detector or silicon drift chamber having superior operability due to being liquid nitrogen-free taken as a first sensor with a low count rate but having superior energy resolution for detecting X-rays emitted from a target sample, a proportional counter tube, CdZnTe detector, or scintillation counter taken as a second counter having poor energy resolution but superior count rate with respect to high energy compared with the first sensor juxtaposed in an atmospherically open type sample chamber that is not vacuum-evacuated, with this system allotting two types of detector according to the energy of the fluorescent X-rays by utilizing the first sensor for fluorescent X-rays of low energy and utilizing the second sensor for fluorescent X-rays

of high energy, wherein the latter stage of each detector consists of separate pre-amplifiers, linear amplifiers and wave analyzers, and with quantitative processing being carried out at common control and computing sections.

2. An X-ray fluorescence film thickness measuring device comprising:

a high-voltage supply for exciting fluorescent X-rays; an X-ray generating system constituted by an X-ray tube;

means for focusing primary X-rays emitted from the X-ray generating system onto a microscopic part using a slit, collimator, or capillary utilizing the total reflection phenomenon;

a sample observation optical system for deciding a position of a measuring position of a measuring region on the microscopic part; and

a system having a pin diode detector or silicon drift chamber having superior operability due to being liquid nitrogen-free taken as a first sensor with a low count rate but having superior energy resolution for detecting X-rays emitted from a target sample, a proportional counter tube, CdZnTe detector, or scintillation counter taken as a second counter having poor energy resolution but superior count rate with respect to high energy compared with the first sensor juxtaposed in an atmospherically open type sample chamber that is not vacuum-evacuated, with this system allotting two types

of detector according to the energy of the fluorescent X-rays by utilizing the first sensor for fluorescent X-rays of low energy and utilizing the second sensor for fluorescent X-rays of high energy, wherein the latter stage of each detector as far as the pre-amplifiers consists of separate pre-amplifiers, a wave analyzer function is performed collectively by a single digital circuit, and quantitative processing is carried out at common control and computing section.

3. A fluorescent X-ray film thickness measuring device comprising:

a high-voltage supply for exciting fluorescent X-rays;

an X-ray generating system constituted by an X-ray tube;

means for focusing primary X-rays emitted from the X-ray generating system onto a microscopic part using a collimator;

a sample observation optical system for deciding a position of a measuring position of a measuring region on the microscopic part; a detector for detecting fluorescent X-rays generated by the sample;

a pre-amplifier;

a linear amplifier; and

a wave analyzer, wherein the collimator for a system for performing quantitative processing using a control unit and computing section is configured from a first collimator block for focusing onto the microscopic part and a second collimator

block for emitting X-rays at a normal size located above the first collimator block.

4. The fluorescent X-ray film thickness measuring device of claim 3, wherein the first collimator block comprises a half mirror section and a collimator section located at a side surface of the half mirror section, the second collimator block comprises a plurality of collimator units located in order along a lateral direction, the first collimator and the second collimator can be moved in a lateral direction, and an arbitrary collimator section or half mirror section can be located at a position along the optical axis.